

**What is claimed is:**

- Sub  
Bc
1. A speaker cone, comprising:  
a base portion having a front end and a rear end,  
wherein the front end contains at least one discontinuity such that a first distance from  
a reference point on a longitudinal axis of the base portion to a first point on the front end is  
5 different than a second distance from the reference point to a second point on the front end.
  2. The speaker cone as claimed in claim 1, wherein a flexural wave is radiated  
from the base portion past the front end when the base portion vibrates, and  
wherein the discontinuity substantially reduces an occurrence of at least one  
geometric mode resonance created by the flexural wave.
  3. The speaker cone as claimed in claim 2, wherein the at least one geometric  
mode resonance comprises an azimuthal mode resonance.
  4. The speaker cone as claimed in claim 2, wherein the at least one geometric  
mode resonance comprises a radial mode resonance.
  5. The speaker cone as claimed in claim 2, wherein the at least one discontinuity  
comprises a first discontinuity,  
wherein the first discontinuity comprises a radiating area that is substantially greater  
than a radiating area of a portion of the front end opposed to the first discontinuity.

Sub  
B1

6. The speaker cone as claimed in claim 5, wherein the at least one discontinuity comprises the first discontinuity and a second discontinuity disposed adjacent to the first discontinuity on the front end, and

wherein a radius of the front end gradually changes when travelling along the front end from the first discontinuity to the second discontinuity.

7. The speaker cone as claimed in claim 5, wherein the at least one discontinuity comprises the first discontinuity and a second discontinuity disposed adjacent to the first discontinuity on the front end, and

wherein a height of the front end gradually changes when travelling along the front end from the first discontinuity to the second discontinuity.

8. The speaker cone as claimed in claim 7, wherein a radius of the front end gradually changes when travelling along the front end from the first discontinuity to the second discontinuity.

9. The speaker cone as claimed in claim 1, wherein the at least one discontinuity causes a first portion of the front end to be located in a perpendicular plane that is perpendicular to the longitudinal axis of the base portion and causes a second portion of the front end to not be located in the perpendicular plane.

10. The speaker cone as claimed in claim 1, wherein the at least one discontinuity causes a radius of a first portion of the front end to be different than a radius of a second portion of the front end.

Sub  
B2

11. The speaker cone as claimed in claim 1, wherein the at least one discontinuity contains a plurality of discontinuities.

12. The speaker cone as claimed in claim 11, wherein the plurality of discontinuities is an odd number of discontinuities.

13. The speaker cone as claimed in claim 11, wherein the plurality of discontinuities is an even number of discontinuities.

14. The speaker cone as claimed in claim 1, wherein a cross-section of the base portion is circular.

15. The speaker cone as claimed in claim 1, wherein the speaker cone is a whizzer cone that reproduces high frequency sounds.

16. The speaker cone as claimed in claim 1, wherein the at least one discontinuity comprises a plurality of discontinuities that are evenly spaced around the front end of the base portion.

17. The speaker cone as claimed in claim 16, wherein the plurality of discontinuities have the same size and the same shape.

18. The speaker cone as claimed in claim 17, wherein the plurality of discontinuities form a cyclical wave in the front end of the base portion.

Sub  
B3

19. A speaker cone, comprising:  
a base portion having a front end and a rear end,  
wherein the front end contains a plurality of discontinuities that form a cyclical wave  
in the front end of the base portion.

20. The speaker cone as claimed in claim 19, wherein a first distance from a  
reference point on a longitudinal axis of the base portion to a first point on the front end is  
different than a second distance from the reference point to a second point on the front end.

21. The speaker cone as claimed in claim 20, wherein a radius of the front end at  
the first point is different than a radius of the front end at the second point.

22. The speaker cone as claimed in claim 20, wherein a height of the front end at  
the first point is different than the height of the front end at the second point.

23. The speaker cone as claimed in claim 19, wherein the entire front end has an  
odd number of discontinuities.

24. The speaker cone as claimed in claim 19, wherein the cyclical wave is a sine  
wave.

25. The speaker cone as claimed in claim 21, wherein a height of the front end at  
the first point is different than the height of the front end at the second point,  
wherein the cyclical wave is a sine wave, and  
wherein the entire front end comprises an odd number of discontinuities.

26. The speaker cone as claimed in claim 25, wherein the speaker cone is a whizzer cone that reproduces high frequency sounds.

27. The speaker cone as claimed in claim 19, wherein a cross-section of the base portion is circular and a radius of the circular cross-section gradually increases while travelling in a direction from the rear end to the front end.

56  
34  
28. The speaker cone as claimed in claim 19, wherein the cyclical wave is a sine wave defined by the following equation:

$$r(\phi) = r_0 + (A)(\sin [(m\phi)/(2\pi)]),$$

wherein  $r(\phi)$  is a distance vector from a reference point on a longitudinal axis of the base portion to the front end of the base portion,  $\phi$  defines a revolution angle of the vector  $r(\phi)$  with respect to the longitudinal axis, and  $m$  and  $r_0$  are constants.

29. The speaker cone as claimed in claim 28, wherein  $m$  equals the number of discontinuities in the front end of the base portion.

30. The speaker cone as claimed in claim 28, wherein  $r_0$  approximately equals an average of a maximum value of the vector  $r(\phi)$  and a minimum value of the vector  $r(\phi)$ .

31. The speaker cone as claimed in claim 28, further comprising a rear wall coupled to the rear end of the base portion,  
wherein the reference point is contained in a plane containing the rear wall.

32. The speaker cone as claimed in claim 31, wherein  $m$  equals the number of discontinuities in the front end of the base portion, and

wherein  $r_0$  approximately equals an average of a maximum value of the vector  $r(\phi)$  and a minimum value of the vector  $r(\phi)$ .

add  $a_1$   $\rightarrow$  Add  $B_0$